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WATERFRONT RECREATION AREA USER BEHAVIOUR ANALYSIS - CASE OF STROOMI AND KOPLIRANNA BEACHES

RANNIKULISE PUHKEALA KÄITUMISMUSTRITE UURIMINE STROOMIRANNA JA KOPLIRANNA NÄITEL

Master's thesis
Curriculum in Landscape Architecture

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Tartu 2018

Eesti Maaülikool
Kreutzwaldi 1, Tartu 51014

Magistritöö lühikokkuvõte

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Õppekava: Maastikuarhitektuur

Pealkiri: Rannikulise puhkeala Käitumismustrite uurimine Stroomiranna ja Kopliranna näitel

Lehekülgi: 61	Jooniseid: 23	Tabeleid: 13	Lisasid:

Maastikuarhitektuuri õppetool
Uurimisvaldkond: S230
Juhendaja: Peeter Vassiljev (*Msc*)
Kaitsmiskoht ja aasta: Tartu 2018

Käesolev töö uurib mereäärse roheala kasutajakäitumist Tallinna Stroomi rannapargi ja Kopliranna näitel. Töö eesmärk on selgitada tüüpilisi käitumismustreid ja asukohaeelistusi erinevate vanuse- ja sotsiaalsete gruppide lõikes. Peamine uurimisküsimus on, milliseid tegevusi võimaldab vaadeldav keskkond selle kasutajale ja milline on nende praktikate potentsiaalne positiivne mõju kohalike elanike terviseharjumustele ja sotsiaalsetele sidemetele.

Samuti oli üks töö eesmärkidest roheala kahe oluliselt erinevate ruumiliste omadustega osade kasutajakäitumiste eeldatavate erinevuste välja toomine. Nimelt pakub Stroomi rannaala omapära huvitavaid uurimisvõimalusi kuna esindatud on nii ülelinnalise tähtsusega liivarand ja avalik park kui seda komplementeeriv, selle vahetus läheduses asuv Kopliranna loodusilmeline jäänuk-roheala, mis võimaldavad vaadelda kasutajate käitumist samaaegselt erineva kvaliteediga aladel.

Uurimismetoodikas kasutati vaatlust *BlueHealth* projekti raames väljatöötatud GIS-süsteemi põhise BBAT - tööriistaga, millele lisandusid konteksti loomiseks kvalitatiivseid andmeid esindavad joonised keskkonnaomaduste kohta.

Tulemustest võib välja tuua erisused külastuste arvus nädalapäevade, kellaaegade ja soo lõikes ning samuti nende valdavalt erineva sotsiaalse konteksti. Vaatluste käigus kaardistati mitmeid tegevusi, mis paljastavad huvipakkuvaid kasutusvõimalusi, mida antud keskkond selle külastajale võimaldab.

Tulemustest ja arutelust lähtuvalt tuleks võimalikke tuleviku planeeringuid ja muudatusi prognoosides arvestada, et uuringuala erineva ruumilise kvaliteediga rannaalad täiendavad teineteist, ja see on säilitamist väärt omadus. Edaspidiste disaini- ja poliitotsuste tegemisel tuleks kehtivasse korraldusse pigem minimaalselt sekkuda ja sihilikult kaasata erinevaid sotsiaalseid rühmi, kujundamaks nende terviseharjumusi ja heaolu loovaid praktikaid positiivses suunas mõjutavaid rohealade omadusi.

Märksõnad: käitumise kaardistamine, veealad ja tervis, veealade rekreatsioon, mitteametlikud rohealad

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Abstract of Master's Thesis

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Speciality: Landscape Architecture

Title: Waterfront recreation area user behaviour analysis - case of Stroomi and Kopliranna beaches

Pages: 61	Figures: 23	Tables: 13	Appendixes:

Chair of Landscape Architecture
Field of research: S230
Supervisor: Peeter Vassiljev (*Msc*)
Place and date: Tartu 2018

The research is about the use patterns and preferences of a public waterfront recreation area in the example of Stroomi beach park in Tallinn, Estonia with aim is to study the use patterns among the different social and age groups within it and to research which activities does the environment afford the users and what could be their positive effect on the social cohesion and healthy practices of the visitors.

The research is likewise looking to bring out and understand the possible differences in the use patterns of the study site divided in two characteristics areas: Stroomi beach park and Kopliranna which both contribute to the urban waterfront recreation in Tallinn however they have a different history and present quality.

The methodology used behaviour mapping with the BlueHealth Behaviour Assessment Tool, which is a GIS-based tool to developed in the framework of the BlueHealth initiative that enables recording levels of activity and later compare and analyse the data in a spatial context. The data gathered was also complemented with drawings of the spatial characteristics of the site to provide additional context to the quantitative information.

The results show clear differences of the visits by the time of the day, the time of the week, by gender and social context. During the observations, there were some activities recorded that can be considered innovative in the context and expose some of the unique affordances of the site.

Based on the results, when considering the possible future developments, the different qualities the area offers should be maintained and taken into consideration. Participatory methods should be used to define the expectations and perceptions of the local residents whose healthy practices and social ties could be improved with the help of the quality of their common waterfront recreation area.

Keywords: behaviour mapping, blue space, blue health, waterfront recreation, informal green space

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INTRODUCTION

The research is about the use patterns and preferences of a public waterfront recreation area in Tallinn, Estonia. The aim is to study how individuals and different groups understand the various qualities of the recreation area and behave in and with it. The users' perceptions and interpretations of the space were not studied by interviews as I believe the area is stigmatised by the general public and that people's interpretations of the space tend to be constructed by external sources not their personal experiences and therefore not reflect what is currently taking place in the area. Observational tools were used instead to study users' actual behaviour in the studied space.

The topic was chosen as the site provides interesting possibilities of researching human behaviour in different spatial situations set in the same context. The study areas Stroomi beach together with Kopliranna shoreline both contribute to the urban waterfront recreation in Tallinn however they have a different history and different present quality. The area's main characteristics were also described by illustrative sections which support dividing the study site in two areas of different spatial character and of possibly different use patterns.

Kopli shoreline and the forested peninsula used to be an exclusive natural place for the city's upper class members. There was a small fishers' village at the current Kopliranna and traces of the housing pattern can still be found in the landscape however the private houses no longer resemble to those of the fishers' cabins and the authentic milieu has been lost. The peninsula only developed urban housing together with the construction of the ship factory. Pelgulinna district together with the Stroomi beach used to have a large cotton factory and agricultural irrigated fields. The area was completely transformed by the soviet building rush when the modern standard residential district was built. (Kopli Sonata 2017)

The area has by some time gained quite a notorious reputation of reoccurring violent incidents, drug and alcohol abuse. According to the National Institute for Health Development, an estimated 33% of injecting drug addicts in Tallinn stay in the district of

northern Tallinn, that is approximately 1800 people, of which 23% in Kopli, Sitsi, Karjamaa and Pelguranna areas (Tervise Arengu Instituut 2017). It is interesting to see if the popular waterfront recreation site carries any of these tendencies or what is the social profile of its users. As the North-Tallinn district is also said to lack sports clubs and cultural centres where young people could spend time together (Põhja-Tallinna liikuvusuuring 2014) the research can give an insight into which kind of needs could be catered to by place design.

Official future plans for the area include connecting the shoreline into the beach promenade that should one day give public access to as much of Tallinn coastline as possible. Nowadays the gentrification from Kalamaja district is also shifting to Kopli. Its main advantages are considered its spatial diversity and being bordered by the sea by both sides. However some of the industrial heritage is seen to be transformed into new developments, the existing industries are not expected to go anywhere nor are they threatened by the pressure from gentrification. (Põhja-Tallinna linnaosa üldplaneering 2017)

The theories regarded as the basis for analysing the different potentials of the study area were the attention restoration theory (ART; Kaplan & Talbot 1983; Kaplan & Kaplan 1989; Kaplan 1995), affordances of the environment by J.J Gibson (1989) and the framework on how green spaces influence health and wellbeing described by Hartig *et al*.(2014). The research is looking to find out in what ways does the study area potentially benefit people's health, wellbeing and social cohesion of the district. As the regulated Stroomi beach park is probably pleasing to a larger variety of stakeholders as it is a conventionally designed and well-maintained green recreation area, the unregulated part of the shoreline in Kopliranna might also possess certain qualities that contribute to the wellbeing of certain stakeholders to whom the space provides some possibilities the conventional park does not provide.

The study aims to answer the following research question: what kinds of activities are users engaged at recreational waterfront areas of different character and affordances and if or how are the activities influenced by the spatial attributes. Which kind of activities does

the environment afford to the various social groups and does the BBAT-tool that was used to map user behaviour reveal any correlation between user profile and their interaction with the environment.

Based on the results, it could then be concluded, whether the different use patterns provide us valuable information for future planning and design decisions that would be taking into account the hidden potential of the existing urban green and blue spaces and cater to the needs of the diverse local population.

Acknowledgements:

I would like to thank my supervisor Peeter Vassiljev for his valuable time and help with guiding through the process. Gratitude also goes to the *BlueHealth* Estonian research team thanks to whose work it was possible for me to conduct this research.

1. LITERATURE REVIEW

1.1 Health benefits of green space

Understanding how any relationship between nature and health happens can aid interventions that promote the possible benefits. The multiple pathways related to health benefits in green space may be purposefully combined in cultural practices that regularly bring people together in natural environments.

1.1.1 The pathways to health

The pathways through which contact with nature related to health benefits is described by Hartig *et al*. 2014:

1. air quality, e.g. vegetation improving air quality;
2. physical activity, e.g increased walking for recreation and outdoor stay;
3. social cohesion, e.g. increased interaction with neighbours and a sense of community;
4. stress reduction, e.g. situations helping people maintain adaptive resources as natural areas can reduce exposure to challenging physical and social stressors as well as provide relaxing scenery.

According to Hartig *et al.* (2014), contact with nature involves all these aspects, so multiple pathways are likely to be engaged simultaneously - one of them is usually a primary activity with secondary activities intertwined. The users of the natural environments most likely access the different benefits simultaneously (*ibid*.).

1.1.2 Socio-economic context

Not all studies find evidence of a beneficial association between green space and the health outcomes considered and some even have conflicting results (Markevych *et al*. 2017). There are therefore many complexities underlying associations between green space and health outcomes. According to Hartig *et al.* (2014), it may be that relationships between nature and health differ in spatial, social, economic, racial, cultural and demographic contexts. Therefore, the variety between population subgroups in access to, use of, and response to nature could be explored more.

Green space accessibility by the different population groups is being more and more acknowledged as an environmental justice issue (Wolch *et al.* 2014). Urban green maintenance strategies aiming to distribute the common good in an equal way may nevertheless have an opposite effect: as creating new green areas can make increase the aesthetic appeal and perceived health benefits of residential areas, it can also contribute to increased cost of the land and housing, thus making it less accessible for the very residents it was initially designated for. Urban green space strategies envisaging minimal intervention explicitly look to assure the social and ecological sustainability of the common good. (*Ibid*.)

1.1.3 Health benefits associated with age and gender

The findings of Astell-Burt *et al*. (2014) revealed variation in the association between green space and mental health across the life course and by gender. For men, the benefit of more green space emerged in early to mid-adulthood. Among older women, a curvilinear association materialised wherein those with a moderate availability of green space had better mental health. When the age was not considered, green space was associated with better mental health among men, but not women. (Astell-Burt *et al*. 2014) Relationships

between urban green space and health therefore varies across the life course having more benefits for health at certain points in the life course (*Ibid*.)

1.1.4 Qualities of the green space

Not only the general level of vegetation, but also vegetation type might be of importance for mental health.(Markevych *et al*. 2017). The different types of nature are likely to contribute to a particular pathway to health as according to Hartig *et al.* (2014), natural elements that are effective in improving air quality are not necessarily the same as those best suited for improving social cohesion in a neighbourhood or for promoting psychological restoration.

A study was conducted in Tallinn assessing the usability and evaluations of the qualities of Tallinn's green spaces among the local residents (Tallinna rohealade külastatavus ja külastajate hinnangud 2006); It's results showed that residents' contentment with the green spaces did not reveal much correlation with their social status or gender. The only difference was that men generally considered the state of vegetation to be better than did women. Retired people were generally happier with the state of green spaces than were the younger generations of children, students and working people. Significant discontent was distinguished among the unemployed, but it was noted that their assessment might have also been influenced by their general situation. According to the survey the residents also stated that they wished there were more children's playgrounds and attractions for different ages, and also public drinking wells. They wished green areas were more versatile with more water bodies (fountains, ponds) and shelters to be able to hide from unpleasant weather conditions while still enjoying the greenery. The survey also stressed the need to develop official study-purpose tracks in the city's natural areas and developing hiking trails within them.(*Ibid*.)

1.1.5 Affordances of space

It was hypothesised prior data collection that the affordances differ between the informal and formal parts of the study area and thus do the different uses. The assumption is based on the concept of affordances first introduced into landscape architecture studies by an environmental psychologist H. Heft with his taxonomy of the possible affordances of children's environments published in 1988, and with the dimension of social affordances added later by M. environmentKyttä (2002). Their work was based on on the theory of the perceptual psychologist J.J.Gibson's theory ("The Ecological Approach to Visual Perception" 1986) which considers the environment as object of interpretation by living organisms whose actions are a direct reflection of the qualities and features of the space suited for their capabilities.

1.1.6 Attention restoration theory

Green-space has received substantial attention as a resource for psychological restoration (Hartig *et al*. 2014). one of the leading theories within environmental ecology regarding the study of the restorative value of green space is attention restoration theory (ART; Kaplan & Talbot 1983; Kaplan & Kaplan 1989; Kaplan 1995) on environments that facilitate resting. According to the theory, the environment must have certain qualities that would help restore human's directed attention capability. Directed attention is considered a key ingredient in human effectiveness and the fatigue of directed attention similarly a key ingredient in ineffectiveness and human error. In order to rest directed attention, it is necessary to find an alternative mode of attending that would render the use of directed attention temporarily unnecessary. (Kaplan 1995)

Content that does not require directed attention such as wild animals and spaces and extremes of soft and hard entertainment trigger Involuntary attention. This kind of soft fascination that is characteristic of certain natural settings provides an opportunity for

reflection, which can further enhance the benefits of recovering from directed attention fatigue (Kaplan 1993). Fascination is but one component of the model for recovering directed attention as Kaplan & Talbot (1983) have described three additional components essential to a restorative environment: being away; extent; compatibility;

An ambiguous or distracting environment raises many irrelevant possibilities, placing more demand on directed attention. A compatible environment requires less selectivity and hence less directed attention. (the regular formal park area might be more compatible with the larger population and has therefore a better restorative effect).

1.2 Formal and informal urban green space

Landscapes that have been left over and are transitioning between their past and future functions, landscapes with no formal spatial arrangement, can be considered voids in urban structure, blank or derelict areas that hold within them a potential quality and rich content worthy of consideration in city planning. (Bell *et. al.* 2014). Unlike formal green space, human origin and ecological conditions, not management, are the factors influencing informal green spaces the most. (Rupprecht & Byrne 2014).

Urban derelict space can form a valuable complementary element to the formal green spaces of a city. Wastelands being often biologically diverse with their unregulated status can provoke innovative spatial activities by a wide range of users. Unregulated space can successfully function as an attractive outdoor environment and green space does not need to be built to be a park or a playground. Users of urban derelict places can be strongly attached to the site's particular settings and current user behaviour may suggest functions and properties worth keeping, adding to or avoiding when regeneration is considered. (Bell *et. al.* 2014).

A public participation GIS approach study by Pietrzyk-Kaszynska *et al*. (2017) illustrated differences in valuation of formal and informal green spaces by the participants and found

that places valued for their greenness, pleasant views, uniqueness, wild character and role as natural habitats were predominantly marked outside of formal green spaces.

A study by Bonthoux *et al*. (2018) assessed the perceptions, evaluations and uses of wastelands by residents to test whether preferences for wastelands depended on where wastelands were located in the city, plant community characteristics or resident characteristics. Analysing the wasteland characteristics and interviews with residents, the results highlighted that a significant proportion of residents (36%) conducted various activities in wastelands and that the perceptions and valuations of wastelands were diverse, ranging from either negative (when wastelands were perceived as wild or abandoned areas) or positive (when wastelands were considered as natural areas). The valuations strongly depended on the successional stages, with intermediate grassland-like wastelands being preferred (out of a distinction between initial and intermediate grassland stages and shrubbery stage). They found no effect of wasteland location in the city, whereas residents' age and gender marginally influenced valuations. (Bonthoux *et al*. 2018)

Despite their official vacancy, urban wastelands can host informal uses for a significant amount of residents (Unt & Bell 2014 & Bonthoux *et al*. 2018). They also provide great opportunities for children and teenagers to develop contact with nature and to experience adventure and the notion of risk (Bonthoux *et al*. 2018). User activity is connected with the properties of the environment and the unregulated space can have many stimulating as opposed to the intimidating influence on the use of space (Bell *et. al.* 2014).

Wastelands and unregulated areas offer potential of urban development but are often negatively perceived when showing signs of neglect and being indicative of districts' social problems (Bell *et. al.* 2014). The classification of the different urban green spaces can be challenging but the need exists to identify and address informal green spaces in urban green space governance. Pietrzyk-Kaszynska *et al*. (2017).

1.2.1 The unintentional landscape

An unintentional landscape can be defined as an aesthetic encounter with nature that has not been purposely created. In some cases, so-called wastelands or *terrain vague* have been appropriated as spaces of adventure, creativity or discovery. In other cases, these anomalous spaces have been the focus of anxiety or disdain, the marginal points of urban nature having engendered a variety of responses ranging from delight or indifference to various forms of fear and hostility are which will eventually be simply erased to make way for more lucrative forms of land use. (Gandy 2016)

Urban and industrial wastelands can be spaces of aesthetic discovery including acoustic, olfactory and tactile dimensions that are routinely overlooked by a narrow sense of landscape as a purely visual experience. These places can also serve as surrogate forms of public space, especially where there is limited provision of parks, constituting an element of the 'urban commons.' In some cases, the aesthetic and ecological characteristics of 'wild urban nature,' found in the redundant spaces have been directly incorporated into landscape design with the concept of the 'park' shifting from the labour intensive municipal landscapes of the past towards a different kind of synthesis of urban culture and nature. (Gandy 2016)

1.3 Blue space

Rupprecht *et al*. (2014) suggest a definition for blue space as ''health-enabling places and spaces, where water is at the centre of a range of environments with identifiable potential for the promotion of human well-being.'' However, the direct effect blue spaces may have on health is difficult to determine and users often describe the benefits of visiting a waterfront recreation area first of all as psychological even though it might not have been their first intention for visiting (de Bell *et al*. 2017).

1.3.1 The *BlueHealth* initiative

The study area of this research is part of a larger initiative named *BlueHealth* which is investigating how water-based environments in urban areas can affect their resident's health and wellbeing (Behaviour observation mapping 2018). In the framework of the study, the *BlueHealth* Behavioural Assessment Tool (BBAT) was designed by a research group in the Estonian University of Life Sciences to help with the systematic observation of a site's use. It captures who is doing what and where, and allows researchers to make comparisons between different social groups and activities in different parts of the research area (*BlueHealth* 2018).

The BBAT- tool however focuses on certain predefined types of healthy behaviour taking place at the study area. To get a more complete picture of the links between blue space and healthy behaviour, other aspects such as residents' lifestyle, general health and the way people experience blue space during the visit need to be taken into account. For this matter, as part of the *BlueHealth* programme, a SoftGIS survey is used in Tallinn to give an insight into how the residents of the city use blue spaces such as the sea, lakes and rivers. It will capture people's attitudes towards these places, as well as any possible health and wellbeing benefits. (*BlueHealth* 2018)

The general inattentiveness to blue space in planning issues makes it however difficult to measure long-term effects of its influence on well-being even if the salutogenic benefits are identified (Völker & Kistemann 2011). Their concept for assessing salutogenic health effects in blue space considers blue space as a multi-dimensional term that includes four broad space dimensions of appropriation: active, social, symbolic and experiential; as well as at least five ontological dimensions of substantiality. The benefits clearly related to blue space can be identified with regard to perception and preference, landscape design, emotions, and restoration and recreation (*Ibid*.)

1.3.2 Social interaction in blue space

Similarly to findings from green space studies, the social interaction and psychological benefits developed in blue space have been identified as particularly important.

de Bell *et al.* (2017) describe the characteristics of visits to blue space and investigate whether the benefits reported in studies of green space defined by Hartig *et al*. (2014) – physical activity, social interaction, and psychological benefits – are evident with respect to blue space. They considered sociodemographic factors known to influence the relationship between the natural environment and health and their effect on the characteristics of visits to blue space, the benefits people said to have received from their visit, and the value they placed on nature when visiting. Social interaction and psychological benefits were found to be the most important benefits obtained from visiting blue spaces. The socioeconomic status was a predictor of both frequency and location of visits and was also associated with identifying social interaction as the most important benefit. (*ibid.*)

The respondents who were most socially disadvantaged were most likely to report social interaction as the primary benefit, pointing to the role that blue space could support social engagement and improve well-being among those at greatest risk of poor health, however the most socially disadvantaged groups were least likely to report visiting a blue space frequently (de Bell *et al.* 2017). It is therefore important to provide equal access to blue space for people of very different social status and as a priority in planning and design address the needs of the most disadvantaged with mobility or other health-related issues.

1.3.3 The importance of nature on well-being in blue space

de Bell *et al*. (2017) found in their survey about the importance of nature in mediating social and psychological benefits that the respondents who reported psychological benefits as the most important benefit were more likely to find nature very important to their visit.

The importance of nature in underpinning these reported psychological benefits was relatively greater for older people compared with younger adults: the respondents who were female, older and socially advantaged were more likely to regard nature as very important to their last visit to blue space (de Bell *et al.* 2018). These findings highlight the social and psychological benefits obtained from visits to blue space, and provide evidence on the importance of the natural environment in supporting these benefits.

1.4 Environmental preferences

Environmental preferences are viewed as having substantial genetic evolutionary basis (Kaplan & Kaplan 1989). A study by Tyrväinen *et al*., (2003) about residents' aesthetic preferences of Helsinki's small urban forest management also suggested dependance on affective reactions. Their perception-based approach to address the visual aesthetic quality of the landscape found by comparing images of different types of managed forests that pine stands and pure birch stands were the most preferred among residents, and the most disliked were pure spruce stands and mixed stands of deciduous trees (Tyrväinen *et al*., 2003).

People living in private and terraced houses preferred a higher degree of forest management than did people living in flats. Residents living in block of flats also appreciated less undergrowth management whereas private house residents preferred on the average thinned stands where undergrowth was managed. It was suggested that private and terraced house residents might consider local urban forests as a continuum of their managed gardens and yards. (Tyrväinen *et al*., 2003) People's habitual outdoor space experience might therefore be influencing their expectations of public outdoor green spaces.

The notion of experience influencing preference is also valid for active visitors and nature observers who preferred natural forest environments and accepted unmanaged forest vistas in contrary to those who visited forests rarely and preferred managed forests (Tyrväinen *et*

al., 2003). Even as it sounds reasonable to give more weight to the expectations and preferences of the active users (*ibid*.) like regular visitors and nature observers, then with the aim to increase regular uses of urban green areas among city residents, the green areas could accommodate for a larger group of stakeholders when managed at a more intensive level.

1.4.1 Residents' age and gender affecting nature preferences

Individual preferences in urban green areas may be influenced by factors such as accessibility, visibility and security. Preference studies from North America have shown that attitudes towards the environment differ between children, teens and adults (Kaplan & Kaplan 1989) with the youth appreciating the wild, dense and hidden forests.

Tyrväinen *et al*., (2003) also found in their survey of urban wood management preferences that age had an influence on the approval of dead and decayed trees: the younger the respondent, the more dead and decomposing wood was approved of. Men, young people and highly educated individuals accepted ecological management options, abundant undergrowth and decaying wood in urban forests better than other groups, supporting the researchers' assumption that knowledge increases the acceptance of ecological management. Whereas it was found that that men tended to approve of dead trees and decaying ground-wood more readily than women, then other differences based on gender in their survey of urban wood management preferences remained relatively small. (*Ibid*.)

According to the survey of de Bell *et al (2017) w*omen were more likely than men to value nature and that the likelihood of finding nature important increased with age. As men have been found to value more than women the wilder-looking recreation areas (Tyrväinen *et al*., 2003) and are more satisfied with the vegetation of urban green spaces (Tallinn rohealade külastatavus ja külastajate hinnangud 2006), then women claiming to value the importance of nature in their green space experience might have in mind a certain standard towards the kind of quality of nature that requires more intensive management.

1.5 Behaviour mapping

Behaviour mapping is considered as an objective method for observing user behaviour patterns linked to the built environment (Cosco *et. al.* 2010). It is one of the tools that help to study people in their immediate physical environments, as opposed to studies researching user preference with remote methods that may be dictated by different ways of representation (Bell & Unt. 2014).

As any observation is inevitably going to be selective and based upon a particular observational perspective (Mason 2002), the knowledge generated is therefore of a constructed nature and highly contextual. In any setting, there are also some hidden contextual factors such as demographics and cultural rules that emanate from elsewhere than the physical space of the setting and which may also shape what takes place within it in addition to the evident physical space. This is why the setting cannot be solely understood from the inside, but as a local operation of something wider which is seen in the behaviours of people within it, in the interactional rules which seem to be operating in it, and in elements of spatial organisation. (*ibid*.)

The research applying field work and data analysis could be useful in planning and design practice as part of a participative approach to gain insight into how the behaviour patterns of open space users and the spatial properties are interdependent.

An example of a project experimenting with how behaviours are influenced by the scale and quality of the built environment is being conducted by the Gehl institute (Gehl Institute 2018) in MIT campus in Cambridge, Massachusetts. Their project called BenchMark at one of MIT's busy quads uses movable benches equipped with sensors to track where each bench is located, if it is being sat on, how noisy the space is, how many people are in the public space, and also the lighting intensity. The data so far has showed that in the setting of university quads, movable benches are used as focal points for social interaction but the

benches should be tested in a diversity of cultural settings, which is why more new locations for the project are anticipated (Gehl Institute 2018). The qualitative and quantitative data gathered with this method of mapping people's behaviour in a study area should finally help designers with providing better public spaces suited for various spatial and social contexts.

2.3.2 SoftGIS methods

With the help of SoftGIS methods, the perceptions of residents could then be combined and analysed alongside the information concerning the physical structure of the space. The method could enable engaging groups otherwise difficult to reach with participatory approaches, for an example to research why some people do not visit the area under study. And when the data is then visualised, special care needs to be taken in order to avoid any stigmatisation of certain areas. (Kyttä & Kahila 2011)

2. METHODOLOGY

2.1 Introduction

The research consists mainly of quantitative (user observation) methods with some added qualitative context (describing the main characteristics of the site and the context in the city). (Mason 2002)

Undisclosed Naturalistic observation method (McLeod 2015) was used to study the spontaneous behaviour of participants in natural surroundings by simply recording what is seen by the researcher. According to McLeod (2015), the method is often used to generate new ideas as it can suggest novel pathways for research. This might come in particularly useful when looking to redesign the physical environment.

Naturalistic observations are generally conducted on a small-scale, which makes it difficult to to be generalised to a wider setting. With the natural observation method, cause and effect relationship cannot be established as we cannot manipulate the variables. It would also be difficult to repeat the research in exactly the same way. (Mason 2002)

2.2 Data gathering

The data was gathered with the behaviour mapping method using the BBAT - tool on site and for later analysis. Behaviour mapping is recording the location of site users together with the their activity practiced. The method is especially suitable in research of the functional properties of the outdoor space (Cosco et. al. 2010).

Respecting the privacy of people present on-site no photos were taken and no videos recorded of them during the observation - no extra information beyond the given data entry forms was recorded that might allow identification of a particular individual in the data.

Before starting the observation a set of parameters were first noted in the digital Quantum GIS file or on paper, including: date and time of the day; weather conditions (temperature in closest available weather station, sunny/cloudy, dry/rainy/snowy, calm/breezy/windy); and the water conditions (calm/waves; high tide/low tide/, open/frozen over; still/slow/ swift flowing, cold/warm). (Behaviour observation mapping 2017)

The observation protocol involved a systematic walk through the site, visiting all sub-areas and taking a visual scan of each. Due to the significant size of the area and limited visibility at places, all visual scans were performed from predetermined observation spots in the direction from left to right. All users observed in the scan were recorded as point data on the site map using the coding selected or, if the codings did not cover an activity, a note of this was recorded separately. The points were accompanied by additional data including: gender (female or male, if gender could not be identified the user was recorded as female); estimated age group (child 0..12, teen 13..19, adult 20..59, senior 60+); social context of the activity (alone, in a group, if unknown then marked as alone); secondary activity (doing something while the primary activity, eg. using a smartphone, drinking, eating etc.). (Behaviour observation mapping 2017)

In case of large number of users, the sub-areas were again subdivided into smaller parcels and more frequent visual scans were made. Each person was recorded in the order of the visual scan from left to right. If a person left the sub-area after being counted, the record was still kept, if a person left the sub-area before being recorded, the record was not made. If a person who had already been recorded once reappeared in the next sub-area during the visual scan, that person was recorded again. There was also an equal chance of another person moving in opposite order and thus never being present in the visual scan and thus never being recorded. (Behaviour observation mapping 2017)

2.3 Data analysis

Once the database completed in QGIS, the layers were then examined and interpreted for an example according to the type of activities, estimated age of people observed, weather and water conditions, the time of the day, the location of visits, etc. the quantitative results interpreted were then organised in tables by the topic addressed and the information about the spatial organisation of the data observed was represented with the images generated from QGIS. Both the visual information and numeric values filtered would allow to describe and compare the different spatial and social characteristics of site use.

However according to Mason (2002), as most users of observational methods write themselves into their fieldnotes and into their analysis as one cannot assume that the observer's experience, my experience, of a setting match those of all others involved and therefore the analysis and explanation of what was going on in the setting will itself be a *post hoc* reconstruction.

2.4 The study site

The study area is part of the urban coastline of Tallinn. From the North it is bordered by an industrial area with an active history of more than a hundred years. The main housing areas nearby were predominantly built since the 1960s and later and consist of blocks of flats. According to the North Tallinn district's mobility research (Põhja-Tallinna liikuvusuuring 2014), the district lacks sports clubs and swimming possibilities.

The entire study site of 16ha can be divided into two areas of very different character (Figure 2): 3.5 hectares of the unregulated area, hereby named Kopliranna and 13.5 hectares of the official Stroomi beach and park (Maaamet 2018).

Figure 1. The research area represented in red hue (base map source: Maaameti Geoportaal 2018)

Figure 2. The research area divided in two: Kopliranna and Stroomi beach (basemap source: Maaamet 2017)

2.4.1 Stroomi beach and park

Stroomi beach is an important green recreation area and official beach in the scale of the entire city of Tallinn. The design of the regulated park area is rather formal and logical in the sense where the pedestrian paths act as extensions of the streets in the residential housing area and divide the park's green plains into equal sections and eventually provide clearly defined access to the sandy beach through the dunes (Figure 2).

The park area consists mainly of wide open spaces with occasional groves of trees. The park's inventory includes regular park benches by the main paths, movable picnic benches, outdoor gym elements, playground elements, changing cabins and some seasonally installed benches at the beach, bigger stones on the grass for sitting, information stands, the café's terrace, ball playing courts together with ping pong tables. The main asphalt pathways are lighted and so are the grass-covered areas under the trees. Therefore the main

area of the park is made accessible and visible at nighttime (as seen also in Figure 3) but the sandy beach itself together with the dunes, have no supplementary lighting and are therefore left almost pitch black at nighttime.

Figure 3. Evening view on Stroomi beach from Kopliranna (photo of author)

2.4.2 Kopliranna shoreline

The unregulated shoreline is dominated by spontaneous vegetation (Figure 4), complemented by the remains of former private gardens and paths. Water is accessible all along the shore and bordered with variations of sand, pebbles, bigger stones and chunks of concrete possibly affording a variety of uses.

During the Soviet times access to the now unregulated part of the coastline was blocked and it only became accessible after the collapse of the Soviet Union. The area has nevertheless been neglected ever since with increasing demand from the local population to ‘occupy’ the area, driven in part by the rapid change and gentrification of the district of Põhja-Tallinn. According to the General plan of Põhja-Tallinn district (2016) the surroundings of the site may include an added 14290 m2 of residential and 6060 m2 of commercial land built during 2024-2044. The waterfront area is considered as a ‘park-like’ area defined in the thematic plan of the city’s green structure.

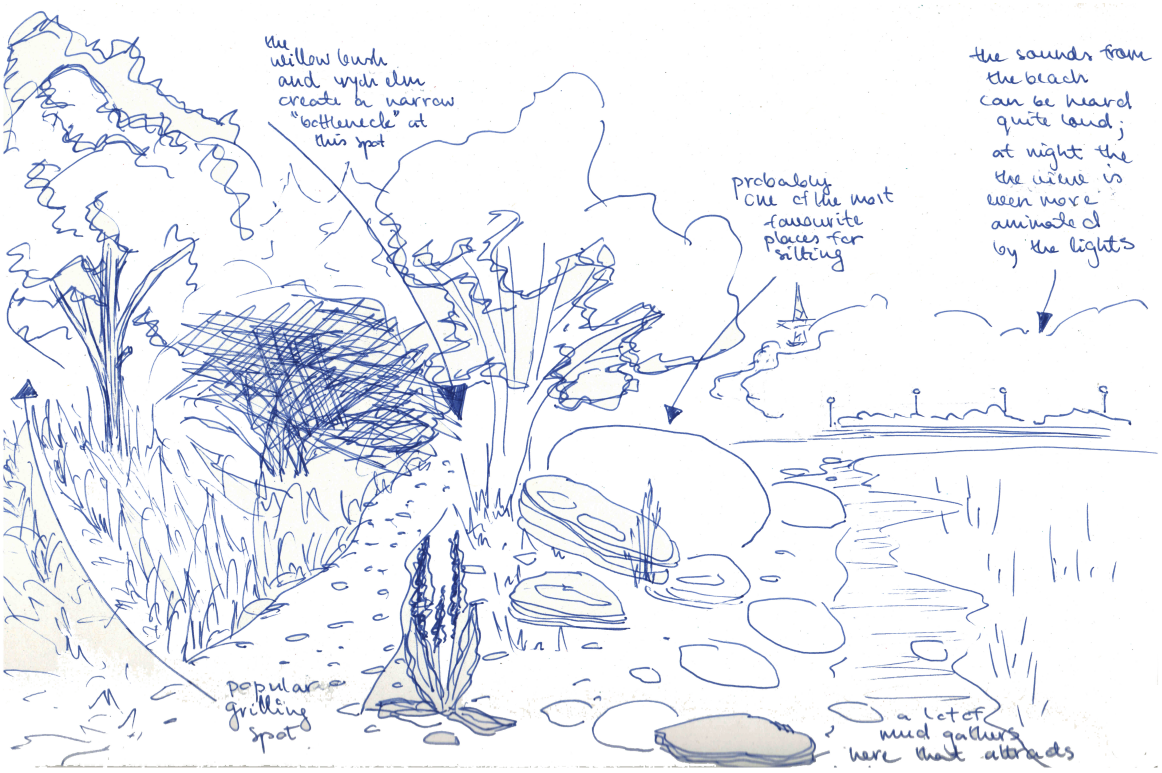

Figure 4. A sketch of some of the characteristics of the site in Kopliranna

Scenic views open from Kopliranna on Stroomi beach: the light sand, grass-covered dunes, the lights at nighttime and the calm sea (Figures 3 and 4) however the opposite view from Stroomi beach towards Kopliranna does not have the same qualities as it is more difficult to distinguish the different textures given the dense spontaneous vegetation creates one dominating mass of green.

2.5 Field work

2.5.1 Observations

Passive data collection was carried out from the end of month of May to the end of month of September in 2017. For the *BlueHealth* intervention case studies it had been established that the May to September/October 2017 period was the most likely for data collection (Behaviour observation mapping 2017). During the observation period the behaviour mapping data was collected every other week, on two random weekdays (Monday to Friday) and one weekend day (either Saturday or Sunday). To ensure a wider range of data,

attention was also paid as to gather data on different days as much as possible, eg. if the first data was collected in the first week of May on a Monday, Tuesday and Saturday, then the next observation session would be on Wednesday, Thursday and Sunday in the third week of May. Altogether, there were 26 days of observations, of which 18 observations were conducted on working days and 8 on weekend days. (Behaviour observation mapping 2017).

The days of the observation period were divided into 4 blocks of morning 7.00-11.00; lunchtime 11.00-15.00; afternoon 15.00 – 19.00 and evening 19.00 – 23. Four-hour time slots allowed for some variation according to the latitude and local patterns of use which had been determined in background data collection for the *BlueHealth* intervention case study. The times for field work observation were selected rotationally, so that consecutive observations cycled through the sequence of morning, lunchtime, afternoon and evening - to ensure that samples were more equally spread among times of the day. If due to a large number of visitors on a particularly popular day of the observation area the observation could not be expected to be completed within one predetermined four-hour time slot, the observable area was split into separate pieces at a place where the new time slot began to observe the remaining territory within the new time slot. (Behaviour observation mapping 2017)

2.5.2 Qualitative data generation

The physical elements and spatial relationships of the landscape under study were analysed in section (Figures 5-10). The data is to support the division of the study site into formal and informal areas.

Figure 5 . Section showing the connection of the Stroomi park area and the seashore across the sandy dunes together with some of the most prevailing spatial situations in Stroomi beach park.

Figure 6. Section showing connection of the Stroomi park area and the seashore through a transparent pine grove

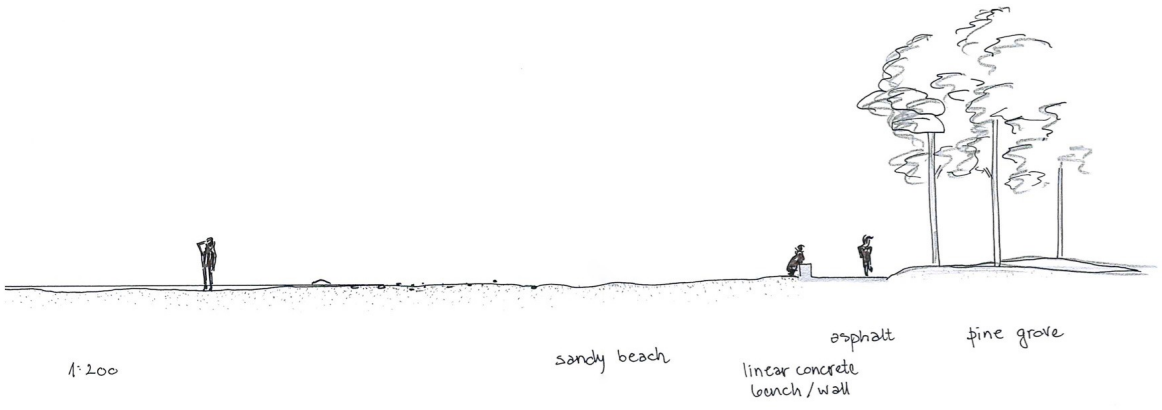

Figure 7. Section of the most visually open access to water from Stroomi beach park

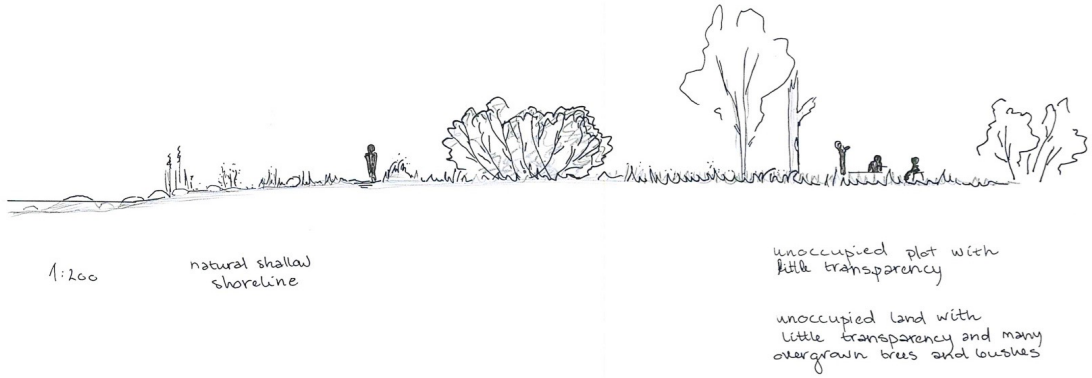

Figure 8. Section of the first impressions of the informal Kopliranna beach accessed from the direction of Stroomi beach.

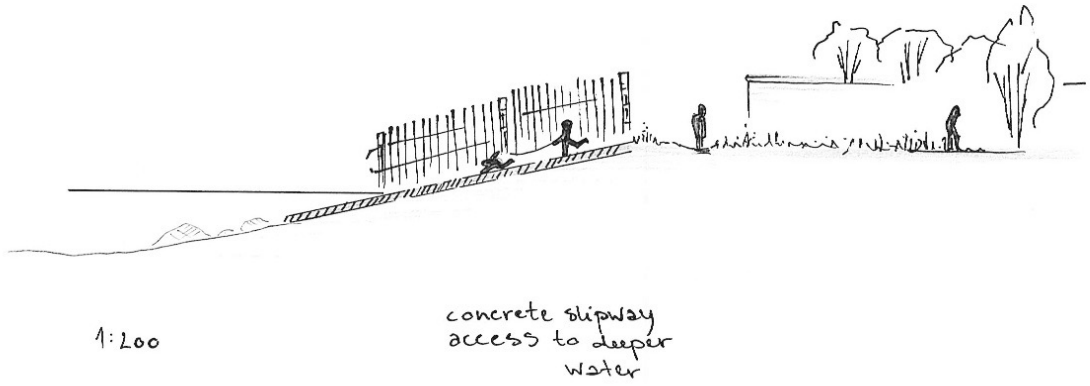

Figure 9. Section of the Kopliranna shore with the old concrete slipway providing direct access to water

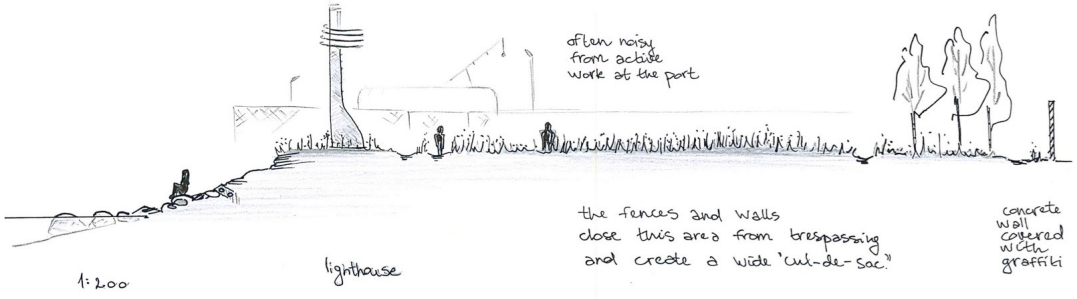

Figure 10. Section of the far end of the publicly accessible shoreline in Kopliranna

3. RESULTS

3.1 Site affordances

Activities noted in the ‘comments’ section of the BBAT tool were used to verify any 'innovative’ or spontaneous activities that reveal some of the affordances of the site and further characterise its user profile.

Table 1. List of the repeatedly recorded activities that were manually added in the comments section of the BBAT-tool.

	activity noted	n° of occurrences
1	spending time in one's car while enjoying the view on the sea	36
2	using the movable picnicking benches	27
3	sheltering from the rain	19
4	playing or listening to music loud	18
5	looking for empty bottles	11
6	taking photos or posing	8
7	Urinating	7
8	moving in a wheelchair	5
9	meditating	4
10	moving with a walking aid	4
11	nude dipping	3
12	making a bonfire	3
13	collecting organic (natural) materials	3
14	sleeping	2

Spending time in one's car by the shore was the most frequently occurring innovative activity noted (Table 1). Both the beach areas provide the possibility to park a car near the shore (Figures 11 and 12) and enjoy the scenery. The people seemed to have driven there

Figure 11. Capture from QGIS data recorded of people visiting the area in their car parked near the beach (base map source: Maaamet 2017)

with the exact intention of using this opportunity to enjoy a pleasant environment in the comfort of their own car.

Using the movable picnicking benches let people relocate them where was most convenient (Figure 13), the benches were often moved to places offering shelter from

Figure 12. Capture from QGIS data showing a closer look at the exact locations that were accessible by car (base map source: Maaamet 2017)

strong winds or from intensive sunlight (by the trees and bushes). The tables were not however on site from the very beginning of the survey period so the data represented is not exactly proportional with other entries.

Figure 13. Capture from QGIS data recorded of the locations of the movable picnicking benches (base map source: Maaamet 2017)

In the event of sudden rain-pour, people found shelter mostly under the thicker clumps of trees in the park and also under the roof eaves of the Stroomi beach main building.

Unique activities that only occurred once were also important to note as the possible affordances of the space even on rare occurrences. Both the informal and formal beach provided 2 of the unique activities listed:

- Climbing on the roof of the garage buildings on site (Kopliranna);
- Digging up the ground using a metal detector (Kopliranna);
- Feeding the birds (Stroomi beach);
- Sleeping in a tent (Stroomi beach).

3.2 User profile analysis

A total of 4602 visitors, of which 2529 female and 2073 male, were recorded in the study area during the behaviour mappings,. Most visits took place in the afternoon (39% of all visits) during weekdays and weekends both (1220 and 578 visits correspondingly). The second most popular time period was lunchtime and then evening. Only 8% of the total visits occurred in the morning. (Table 2)

Table 2. All visits by the time of the day, time of the week and gender.

All visits to area	Total 4602	Female 2529	Male 2073
MORNING	343 (8%)	189 (55%)	154 (45%)
weekday	214	124	90
weekend	129	65	64
LUNCHTIME	1260 (27%)	756 (60%)	504 (40%)
weekday	688	385	303
weekend	572	371	201
AFTERNOON	1798 (39%)	986 (54%)	830 (46%)
weekday	1220	666	554
weekend	578	302	276
EVENING	1201 (26%)	616 (51%)	585 (49%)
weekday	774	406	368
weekend	432	210	222

The biggest difference between gender and the time of visit occurred during lunchtime, when there were 1.5 times more female than there were male visitors. In the morning and afternoon the relation is roughly 1.2 women to 1 man and the relation is most equal in the evening. (Table 3)

When looking at the share of male and female users by the age groups defined (Figure 14.), the biggest difference between gender can be seen among senior users with 1.3 woman for

every 1 man and an opposite ratio of 1.1 male child for each female child. The ratio is relatively equal among teenage and adult age groups with 1.26 and 1.25 female to 1 male correspondingly (Table 3). The results slightly correspond with the typical demographic pyramid with the share of male individuals being greater than the share of female individuals among younger people and decreasing to being less than that of female individuals among older populations.

Table 3. The ratio of female and male users in the different age groups

Age group	Female count	Male count	Ratio
Senior (60+)	642	489	1.3
Adult (20-59)	1478	1181	1.25
Teen (13-19)	171	136	1.26
Child (0-12)	234	261	0.8

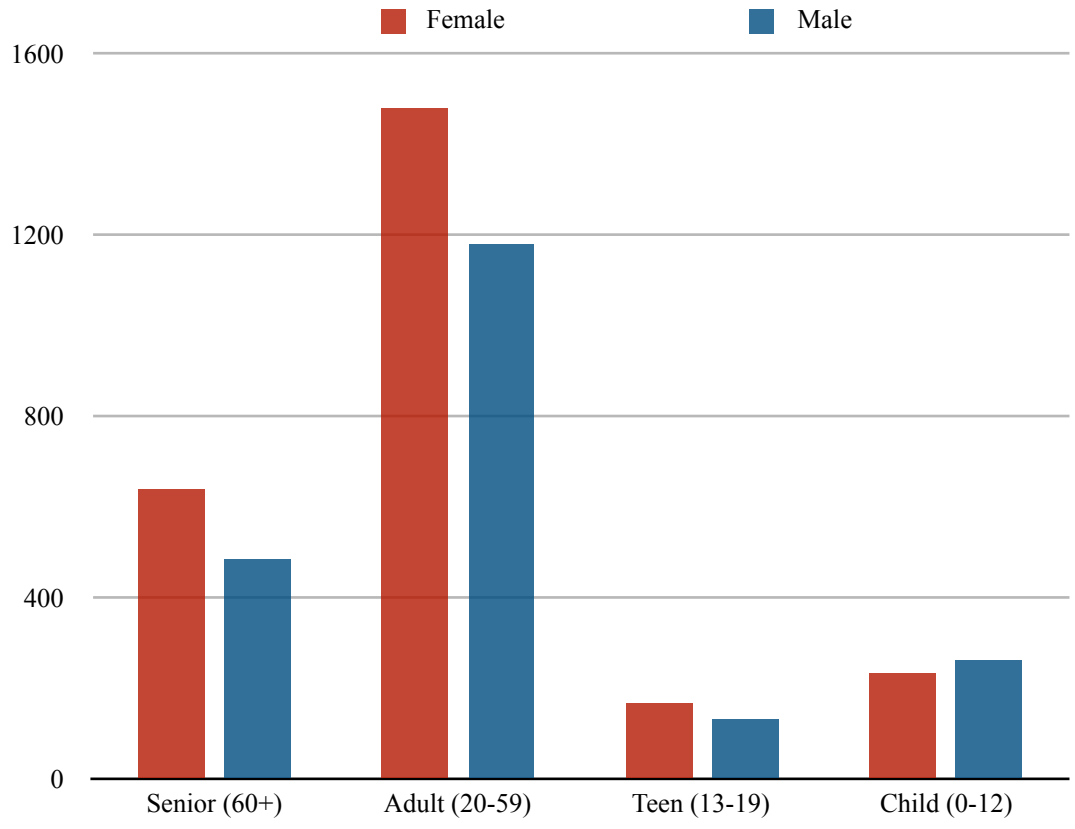

Figure 14. Gender division by age groups

Even thought in general there were more women visiting the study site than there were men, when making a division between Kopliranna and Stroomi beach, it can be seen from the QGIS data (Figure 15) that there were more men visiting the informal Kopliranna beach than there were women: 217 and 137 records correspondingly.

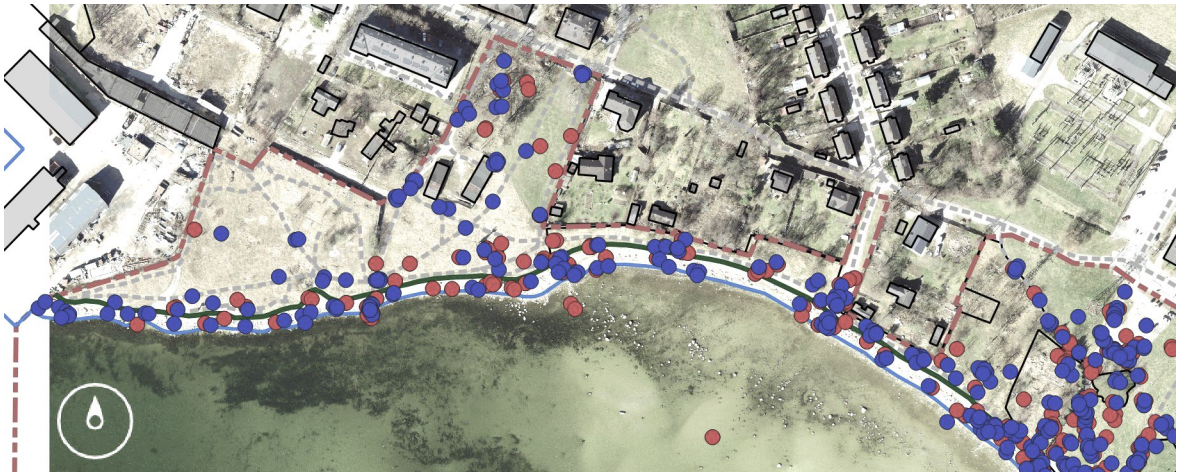

Figure 15. Capture from QGIS data recorded of Kopliranna's visitors by gender; male are represented with blue dots and female with red colour dots (base map source: Maaamet 2017)

There was only one time slot when the share of men was slightly higher which was during the evening of weekends when out of 432 of the total visits there were 210 female and 222 male visitors. The differences between male and female visits were smaller during weekends which allows to hypothesise that a significant share of the women visiting the area during weekdays are either on a parenting leave (with baby pram or together with child) or that the share of retired (senior, age group 4) women visiting the area is relatively high. The share of adult women visiting the area during weekdays was 40% of all the visit by adult women, but the share of them visiting with a baby pram during weekdays is 13% of all adult women visiting and furthermore, 66% of all of the visits with baby pram by adult women took place during weekdays. Only 4% of the adult women visiting the area in weekends were with a baby pram. This shows that a big share of adult women visiting the area with a baby in the pram do it more often in weekdays. The share of senior women visiting the area during weekdays is 45% of all senior women, therefore as with adult age group, a bigger share of them visits the area during weekends. (Table 4)

There were also 19 men altogether recorded with baby pram; 8 of them during weekend and 11 during weekdays' observation. With the ratio of 2,25 it shows a 38% of men with baby pram during weekdays and the bigger share (62%) of them visiting the area with a baby pram during weekends. These figures let us suggest that women generally take the time to visit the area more often during weekdays when together with their baby whereas the men recorded visiting with their baby find the time more likely during weekends.

Table 4. Adult female users who were either visiting the area with baby pram or female visitors in senior age group

Time of the week	Adult women (1478 total)	Elderly women (642 total)
All days	141 visiting with baby pram, which is 6% of all adult female visitors	25% of all women visiting were seniors, of whom 4 recorded with a baby pram
Weekdays	888 records were made, of which 115 with a baby pram; (with the ratio of 2,25 weekdays for 1 weekend days), 66% of the adult women with baby pram were visiting during weekdays.	421 of total weekday visits were registered (with the ratio of 2,25 weekdays for 1 weekend days), weekday visitis constitute 45% of all the visits.
	40% of all visits by adult women were during weekdays	45% of all visits by senior women during weekdays
Weekends	60% of all visits by adult women were during weekends	55% of all visits by senior women during weekends

Table 5. Visits placed in a social context taking place at different time of the week and time of the day

Social context and time of the visits	Total	Female (share in %)	Male (share in %)
All visits alone	1428 (31% of all visits)	848 (59%)	580 (41%)
All visits in group	1572 (34%)	762 (49%)	810 (51%)
All visits in couple	1508 (33%)	869 (58%)	639 (42%)
Weekday visits alone	147	76	71
Weekend visits alone	89	55	32
Evening visits alone	236	131 (56%)	103 (44%)
Evening visits in group	551	268	283
Evening visits in couple	416	217	199

Note. there is a mistake of 2% in the social context of the visits as 94 of the entries were not marked correctly in BBAT

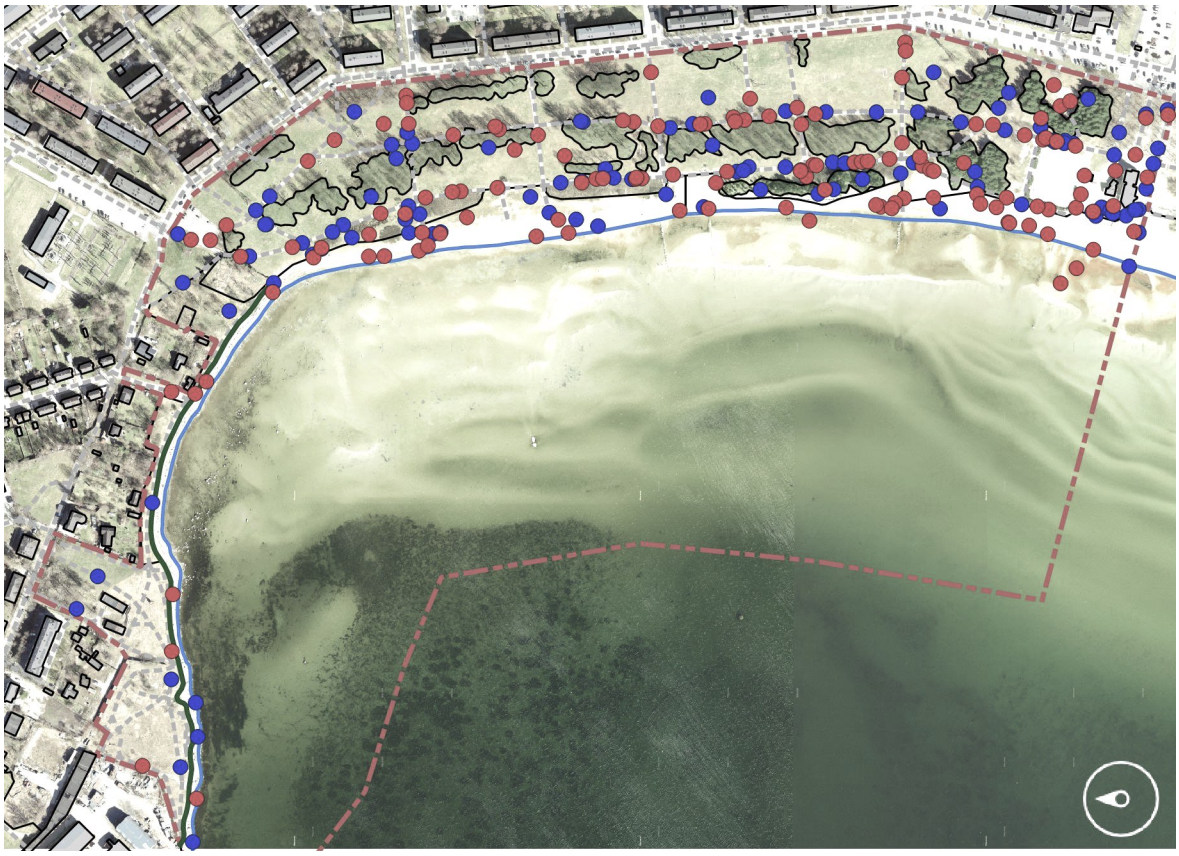

Figure 16. Capture from QGIS data recorded of people visiting the site alone in the evening. Blue dots represent male and red dots female visitors (base map source: Maaamet 2017)

3.2.1 Social context

Social contact is often considered one of the main benefits received from visiting a recreational area. Whether people visit certain areas alone or not can also reveal some of their preferences and their feeling of security. Table 5 shows the visits spread quite equally between visits alone, in couple or in group.

There were more women visiting the area alone in the evening, than there were men. However women in general tended to visit the area in couples whereas men spent time gathered in groups or alone.

It can be seen from the QGIS data map (Figure 16) that there were more female visitors visiting the sandy beach strip alone in the evening compared to male visitors who have

mostly been recorded in the park area. Kopliranna beach is slightly more popular among male visitors which may be explained by the lack of sufficient lighting at night that women prefer not to go there at his time.

Smartphones alter how and where users spend their time (Palsson 2017) as the users are no longer restricted to a static place of work or when they no longer need a physical invitation outdoors, they most likely have more reason to stay outside when desire comes. Like doing work-related activities, smartphones can equally represent a means of socialising while visiting a recreation area and might actually be one of the incentives of going out to a recreation area as it replaces physical company and enables to virtually connect and share with others.

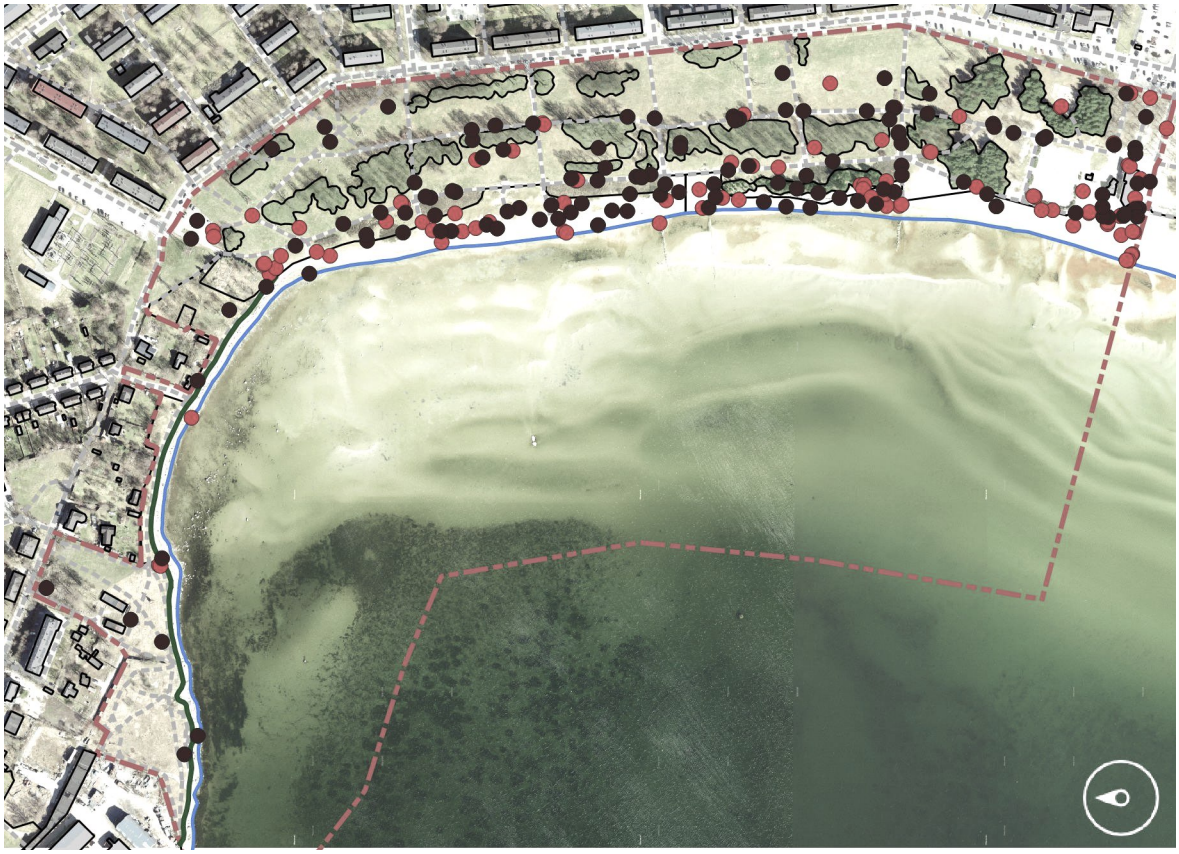

Figure 17. Capture from QGIS data recorded of phones being used by people who were visiting the area alone (black dots) or when accompanied (red dots); (base map source: Maaamet 2017)

142 people were recorded using a smartphone and 82 talking on the phone; 58% (129 people) of the total of people (224 people) using a phone were visiting the area alone

(Figure 17). Out of a total of 1428 people recorded visiting the area alone; 9% of them were using a smartphone or talking on the phone. Out of 848 of the total women visiting the area alone, 73 (9%) were recorded using a phone and out of 580 men, 56 (10%) were using a phone. No significant gender difference can be found among people visiting the area alone and socialising through a phone; both men and women were recorded to behave relatively equal.

14 visitors (4%) out of a total of 370 people in Kopliranna beach were noted using a phone versus less than 1% (213 visitors) from the total of people visiting Stroomi beach. 7 out of 10 people using a phone in Kopli beach were alone, whereas in Stroomi beach the ratio was 6 out of 10, which is not a significant difference between the two areas (Figure 17).

3.2.2 Engagement in potentially healthy recreational activities

The most frequently occuring activities in the area were analysed by the time of the day and by the time of the week to identify any patterns of site use for the potentially healthy or

Table 6 . Potentially healthy or socially or psychologically beneficial activities recorded on all days together

WEEKENDS	**morning**	**lunchtime**	**afternoon**	**evening**	**total**
Jogging	7	0	2	3	12
walking with a dog	15	3	6	33	57
Strolling	48	58	90	105	301
Walking for transport	14	45	31	29	119
Sunbathing	15	403	206	0	624
Grilling and eating	0	16	99	55	170
Cycling	5	9	10	12	36
Total of the above activities in the time slot	104	534	444	237	1319

socially or psychologically beneficial practices.

Table 7. Potentially healthy or socially or psychologically beneficial activities recorded on weekdays

WEEKDAYS	morning	lunchtime	afternoon	evening	total
Jogging	11	9	9	9	38
walking with a dog	16	30	45	41	132
Strolling	61	198	234	209	702
Walking for transport	15	27	127	41	210
Sunbathing	24	6	148	3	181
Grilling and eating	2	11	62	45	120
Cycling	8	20	44	46	118
Total of the above activities in the time slot	137	301	669	394	1501

Table 8. Potentially healthy or socially or psychologically beneficial activities recorded on weekends

TOTAL DAYS	morning	lunchtime	afternoon	evening	total
Jogging	18	9	11	12	50
walking with a dog	31	33	51	74	189
Strolling	109	256	324	314	1003
Walking for transport	29	72	158	70	329
Sunbathing	39	409	354	3	805
Grilling and eating	2	27	161	100	290
Cycling	13	29	54	58	154
Total of the above activities in the time slot	241	835	1113	631	2820

Figures 18 & 19. Capture from QGIS data recorded in weekdays (above image) and weekends (below image); (base map source: Maaamet 2017)

Overall activity level by the time of the week and day (Figures 18 & 19):

- During weekends there was less difference between afternoon and lunchtime visits whereas during weekdays, afternoon visits were roughly twice as frequent as lunchtime visits.
- The share of morning visits stays roughly equal, with 8% of all visits on weekends and 7% of all visits on weekdays.
- The share of evening visits is slightly higher during working days than on weekends, 28% and 25% of all visits correspondingly.

The time of the day and week by the activities practiced (Tables 6-8):

- Jogging. The accumulative number was bigger during weekdays, but the share of joggers from all visits was less than 1% whereas it rose slightly over the 1% out of all weekend visits. The share of jogging was bigger during weekends. Jogging on working days was quite evenly distributed during the day, whereas on weekends it mostly took place in the morning time slot.

- Walking the dog represented 8% of working day visits and 3% of visits during weekends. It contributed however 8% to all of the morning visits in workdays and 12% to all of the morning visits in the weekends. During working days people walking their dogs were mostly recorded in the second half of the day whereas during weekends people walking their dogs were mostly recorded in the morning and even more in the evening.

- Strolling represented 24% of all weekday visits and 16% of all weekend visits, therefore its share decreased significantly during weekend. Strolling was more evenly distributed between the different time slots of working days whereas during the weekends it shifted more towards the afternoon and evening.

- Walking quickly for transport shows the biggest shift from the afternoon during working days to lunchtime during weekends. It's share among other activities decreases during weekends.

- Sunbathing represented only 6% of working day activities and most of it fell in the afternoon time slot and also in the morning time slot. It was however, the most popular weekend activity representing 37% of all visits and taking mostly place on lunchtime.

- Grilling and eating was the third most popular activity in afternoon of weekends. It represented 6% of all visits counted, 8% of the activities listed on weekdays and 13% on the weekends. The afternoon time slot was the most popular time for eating and grilling, with quite a significant difference between in weekday and weekend as there were more people engaged during weekend, however the time of the week seemed to have a rather small influence on eating and grilling in the evening.

- Cycling represented 2% out of all visits during weekdays with afternoon and evening being the most popular time slots and 4% out of all visits during weekends when it was more equally divided on the day with evening being the most popular time.

3.2.3 Interaction with water

There were a total of 66 activities recorded that could be defined water-related: pond dipping, paddling, bathing and active swimming (Table 9). As could have been expected, people tend to engage more in water related activities when the weather conditions are favourable: most of the uses were recorded when the weather was sunny, with calm wind and water. No activity in water was recorded during rain. (Table 9)

Table 9. Water-related activities recorded during different weather conditions

Weather variables	dry	rain	calm	breezy	strong wind	sunny	cloudy	calm water	mild waves
Total of people	66		66			66		66	
Water-related activities	66	0	35	29	2	59	7	56	10

Table 10. Water-related activities recorded during different air temperatures

Temp. values °C	**13**	**14**	**15**	**16**	**17**	**18**	**20**	**22**	**24**	**total**
Number of people	1	3	9	6	2	12	22	6	5	**66**

Interaction with water seems to increase rapidly when the temperatures are higher (Table 10). At this point however the data gathered is too scarce to present a sufficient overview of the effects of weather on people's interaction with water as there were very few people in water (Figure 20) probably due to the generally autumnal weather conditions of the 2017

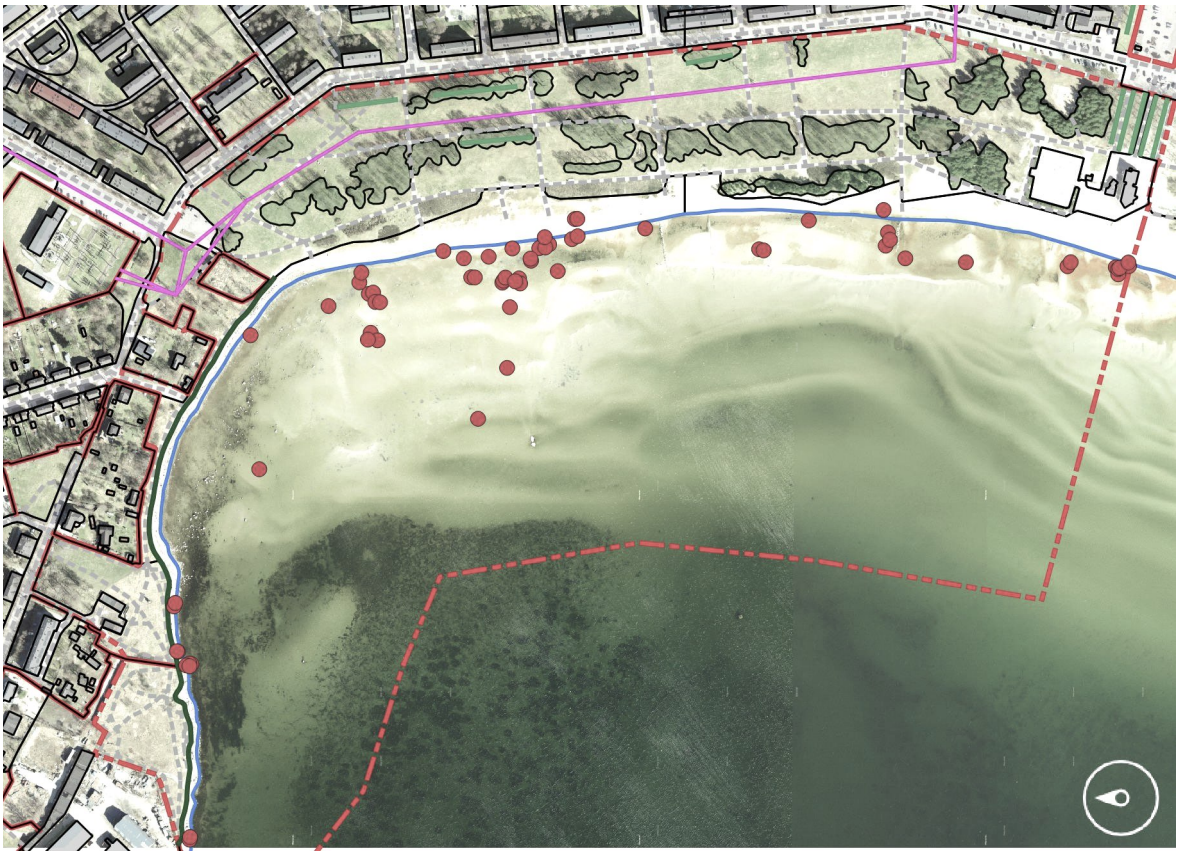

Figure 20. Capture from QGIS of the users recorded in water (base map source: Maaamet 2017)

year summer. Also during the busy beach days when the beach was full of people, not all of the activity in water could be recorded with enough precision as people were mostly far from the shore.

3.2.4 Interaction with water by the time of the day

The afternoon is the most popular time slot for water-related activities (Table 11). Most water-related activities took place in the weekends, especially due to increased interaction with water during lunchtime and afternoon. The morning and evening time slots were however more frequent for water interaction during weekdays than they were during the weekends.

Table 11. Water-related activities by the time of the day

	morning	**lunch**	**afternoon**	**evening**	
Water-related activities	6	3	12	9	**weekday**
	0	12	21	3	**weekend**
Total	6	15	33	12	**66**

Table 12. Interaction with water by age group

AGE groups	**1 (0-12)**	**2 (13-19)**	**3 (20-59)**	**4 (60+)**	
Total	23	14	18	11	**66**

Among water-related activities, children (age group 1: 0..12 years) were engaged the most (Table 12). Adults were only recorded doing water-related activities at the formal beach, whereas other age groups were also recorded using the water features at the informal beach: 4 of them teenagers, 4 seniors and 3 children (Figure 21).

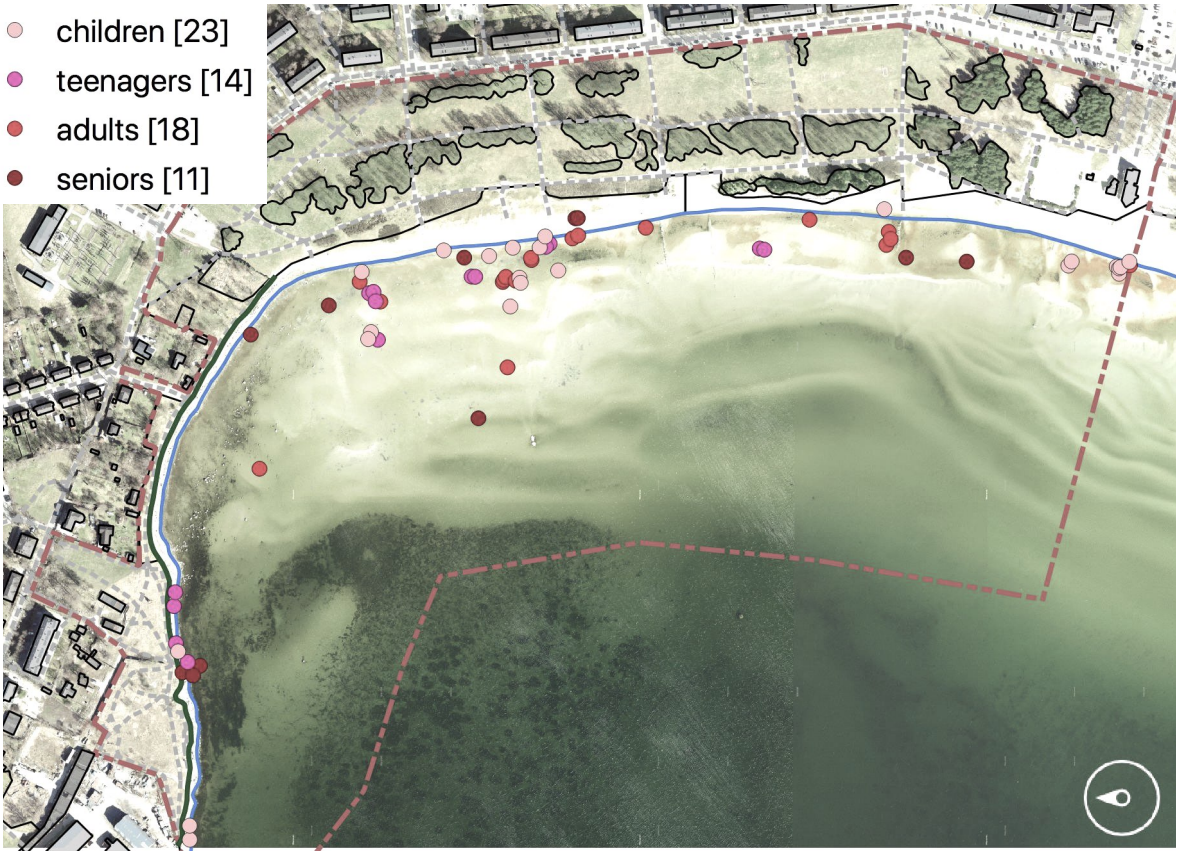

Figure 21. Water-related activities by age groups and area of the beach (base map source: Maaamet 2017)

Whether people walking their dogs have a more frequent interaction with water than the regular strollers.

As the filters in QGIS gave no results for people either walking the dog or strolling and doing any secondary water-related activity simultaneously, I decided to count the records on the map (Figure 22) that were on the sandy or rocky beach strips or in the water: 33 out of a total of 189 people walking with a dog and 174 from a total of 1003 strollers were walking near or in the water, which makes 18% and 17% correspondingly. The visual analysis shows that both groups develop a similar interaction with water in terms of quantity.

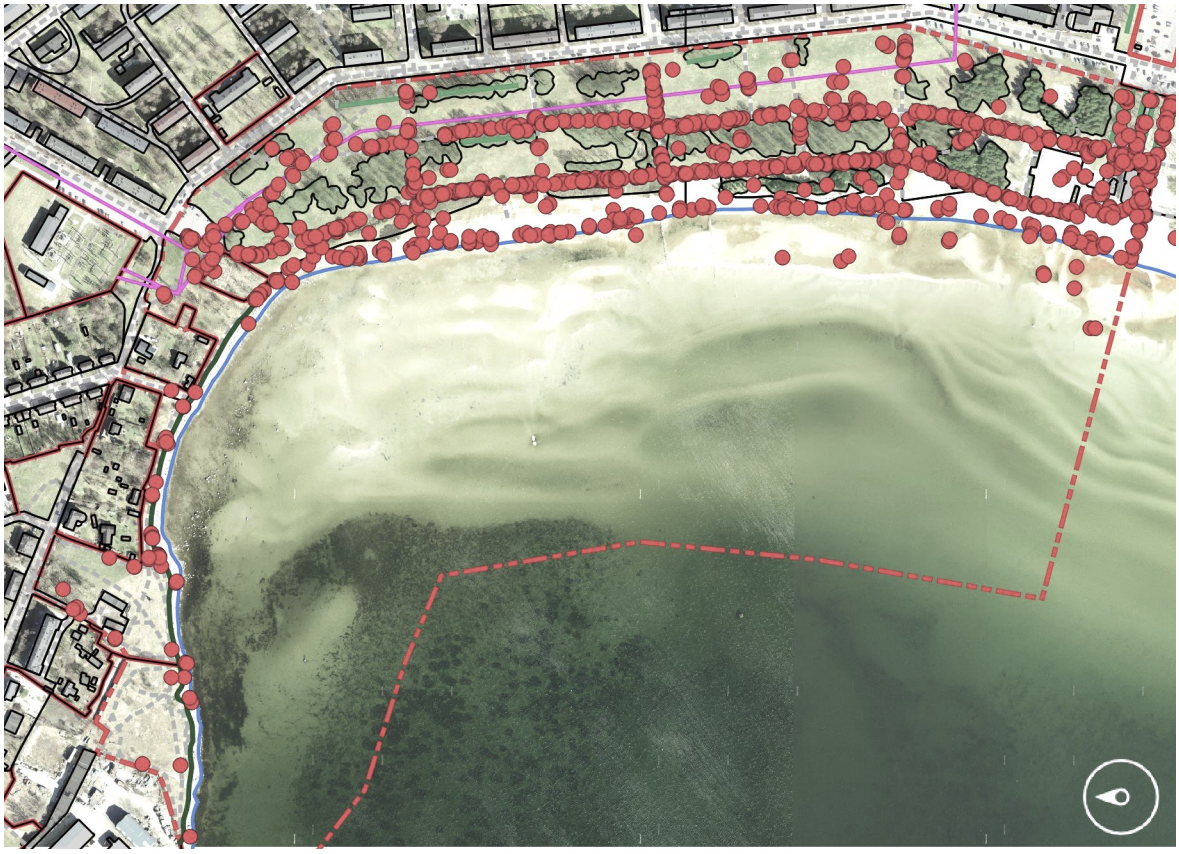

Figure 22. Capture from QGIS of the users recorded strolling and walking their dogs (base map source: Maaamet 2017)

The effect of unfavourable weather conditions on likely routine practices

To test how eager people are to continue their potentially health-benefiting routine practices in the study area like jogging or walking the dog in changing weather conditions, their records were counted in the following weather conditions defined as clearly unfavourable: rain and/or strong winds.

Table 13. Routine practices during unfavourable weather conditions

Activities	Total number of people	Count of people during unfavourable weather conditions	Share in %
Strolling	1003	115	12
Jogging	50	6	12
Dog walking	189	18	10

According to the data in Table 13, the percentage of strollers (12%) and joggers (12%) of all of the strollers and joggers is slightly higher compared to the share of people walking their dog (10%) out of the total of the people walking their dog. Strollers and joggers can be considered slightly more eager to continue their practice even during unfavourable weather conditions than dog walkers. Below is an image (Figure 23) of the users strolling, jogging or walking the dog in unfavourable weather conditions. It can be seen from the map data that most users are concentrated on the asphalt covered areas of Stroomi beach park; only strollers can be seen on the sandy beach and by the water in Stroomi beach and only dog walkers can be seen by the water in Kopliranna.

Figure 23. Capture from QGIS of the users recorded strolling and walking their dogs in unfavourable weather conditions (base map source: Maaamet 2017)

4. DISCUSSION AND CONCLUSIONS

4.1 Overview of the results

Out of the 4 pathways through which contact with nature can be related to health benefits, the three characteristics related to space were evident in the study area. Social cohesion of the site however could be further researched with SoftGIS methods and/or other public participatory methods such as targeted questionnaires to define the expectations and perceptions of the local residents whose healthy practices could be improved through increased social integration.

4.1.1 Site qualities and the different affordances

The built and designed elements such as the different types of benches, playground equipment and the asphalt paths, found their designated use. So did the elements of the informal beach area provide similar situations: rocks for sitting, the dirt paths for strolling and the high grass for privacy. Even though the informal beach does not have any designed elements specifically installed for recreation purposes, many of the recreative activities that are meant to be practiced in Stroomi beach can equally be practiced in Kopliranna. However there are many differences in the type of activity: the ones realised in the informal Kopliranna can generally be seen as more innovative in a way that they are not considered suitable for a formal beach park area as the design of the formal park agrees with a more culturally controlled use and with less interaction with the natural elements of the landscape.

The size and large number of visits of Stroomi beach enabled to expose a variety of uses that have not been premeditated by design of the park and can be considered as intuitive. There were many activities recorded in Stroomi beach park that did not occur in Kopliranna such as collecting organic materials (rose-hip and birch tree branches) or

sleeping. It can be suggested that people picked the plants they were already familiar with in a familiar location and that the place felt safe enough for taking a nap. Moving with the help of a wheelchair or walking aid was also recorded in Stroomi park area only, and never on the sandy beach nor in Kopliranna. The activities unique to Kopliranna however were nude dipping and making bonfires. These results show the obvious affordances of the two areas: as Stroomi beach park is more about convenience and accessibility, then Kopliranna offers more seclusion and exploration to individuals who are willing to or capable of accessing it.

4.2 About the behaviour mapping method used

In addition to the BBAT, qualitative data such as interviews or the different spatial parameters should be gathered as well to be able to set the data collection into context. The BBAT provided little information about the spatial features of the study area, for an example it was impossible to note when people were sitting and whether they were using the benches for that purpose or for an example natural elements such as rocks or the ground. As the locations of benches were not identifiable from the base map, an option of inserting the information with each entry of the behaviour mapping tool could be available.

While entering the data, generalisations had to be often made as some of the activities witnessed were difficult to categorise under the predefined options. For an example when looking at water interaction, as it was complicated to assess whether the activity taking place far in the water was exactly dipping or active swimming, the analysis gathered all the activities connected with water and did not look at the specific activities. Same with the grilling and eating that often took place in groups where some people were busy with grilling and some eating, but the context was the same - related with eating in fresh air as generalised in the analysis.

Connecting the data gathered with the spatial features of each site needs extra effort, therefore some of the spatial information could be transferred into the BBAT in the first

stage to make spatial analysis more effective by the already added and organised context. BBAT can be used to compare the different blue areas at a big unified scale however it does not provide much information about the context of each site.

Supplementary methods such as SoftGIS or advanced remote observation could be added to prove the many actions that left visible traces in the landscape but that could not have been recorded at the time they actually took place.

4.3 Future interest

4.3.1 considerations for planning and political decision making

Even while planning green areas it might seem rightful to take into consideration the expectations and preferences of the active users like regular visitors and nature observers, then with the aim of increasing visits to urban green areas among city residents who benefit least from the health-improving effects of green space, the green areas could accommodate for a larger group of stakeholders when their management level is more intensive and conventional in the urban green space context.

The vulnerable population groups with higher risk of health disorders could have more social incentive to promote visits to natural areas that could then benefit their physical and mental health. Without having to emphasise on nature or the physical activity or outdoor stay as being the aim of the visit, but social interaction as the primary intention, it could be possible to increase integration of the vulnerable user groups. For an example it is highly likely that the movable picnicking benches added to Stroomi beach promoted longer and more social stays among some residents who normally do not take up longer visits in green spaces.

Stroomi beach already functions quite well as a focal point of social interaction outdoors; there is however room for more specific practices that would be initiating regular visits

among the potential local interest groups. Kopliranna could first of all benefit from some of the same safety increasing design practices that have been applied in the design and management of Stroomi beach, such as increased visual permeability and added lighting at night-time.

Considering the needs of different age and social groups whose preferences and choices also vary during their life course, there is no 'one' fixed pathway but rather a range of opportunities and possible affordances to be addressed in design as to promote intuitive uses of the existing richnesses of the environment under study. For an example the fact that men don't visit the study area as often as women do might not depend so much of the area itself or its qualities but also of a difference in priorities or lifestyles of the passive and active users. It could be therefore further researched if the people who do not regularly visit the area have then alternative practices or if not then what kind of qualities and possibilities they would expect from an attractive recreation area.

4.3.2 Social and ecological sustainability

Many factors need to be considered before initiating any new management and design projects for the Kopliranna area. While the pressure from gentrification is becoming more present in time, sustainable solutions in planning require precise formulation and initiation as to render the common green space as self-sustaining and socially coherent for the local community as possible. To avoid the displacement of the initial users the management projects are designed to benefit in the first place, any sponsorship by enterprises interested in developing the area should be considered with care as their main interests are first and foremost of commercial nature.

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RANNIKULISE PUHKEALA KÄITUMISMUSTRITE UURIMINE STROOMIRANNA JA KOPLIRANNA NÄITEL

KOKKUVÕTE

Käesolev töö uurib Tallinna mereäärse roheala - Stroomi rannapargi ja sellega ühendatud Kopliranna roheala kasutajakäitumist. Töö eesmärk on selgitada mereäärse roheala kasutajate tüüpilisi käitumismustreid ja asukohaeelistusi erinevate vanuse- ja sotsiaalsete gruppide lõikes. Peamine uurimisküsimus on, milliseid tegevusi võimaldab uuritav keskkond selle kasutajale ja selle potentsiaalselt positiivne mõju kohalike elanike terviseharjumustele ja sotsiaalsetele sidemetele. Samuti oli üks töö eesmärkidest roheala kahe oluliselt erinevate ruumiliste omadustega osade kasutajakäitumiste eeldatavate erinevuste välja toomine.

Töö aluseks on käsitletud mitmeid teooriad, mis seostavad loodusliku keskkonna mõju inimese tervisele ja erinevaid looduse tunnetamise võimalusi ning kasutajate eelistusi meeldiva mõjuga looduskeskkonna hindamisel.

Uurimismetoodikana kasutati vaatlust *BlueHealth* programmi raames väljatöötatud GIS-süsteemi põhise BBAT - tööriistaga, mis võimaldas koguda andmeid kasutajate hinnangulise vanuse ja soo ja vaadelava tegevuse kohta neid samaaegselt geograafiliste koordinaatidega sidudes. Lisaks vaatlustele koguti kvalitatiivseid andmeid keskkonna kohta, mis on esitatud lõigete, jooniste ja kirjeldava teksti näol, et kogutud andmemahule konteksti pakkuda. Edaspidi võiks BBAT'ile täindusena kasutada veel andmete kogumist SofGIS meetoditega või distantsilt modereeritud kasutajavaatlusi, et identifitseerida selliseid kasutusi, mille jäljed on selgelt ruumis loetavad, kuid mida kontaktvaatlus nende toimumise aja tõttu ei jäädvustanud.

Keskkonna võimaldatud tegevused, mis pole formaalse kujundusega ette määratud: vaatluste käigus kaardistati mitmeid tegevusi, millega pole otseselt ala kujundamisel arvestatud, kuid mis siiski paljastavad huvipakkuvaid tegevusi, mida antud keskkond selle kasutajatele võimaldab ja mille soodustamist või vastupidi takistamist edaspidi disaini- ja poliitotsuste tegemisel kaaluda.

Enim registreeritud innovatiivne kasutus, mida polnud ette nähtud BBAT - töövahendiga, oli aja veetmine isiklikus autos, parkides selle rannajoonele võimalikult lähedale kohtades, kus see oli võimalik. Seda kasutust esines mõlemal rannaalal: nii Stroomi ranna parklas kui Kopliranna autoga ligipääsetavates kohtades. Samuti kasutati aktiivselt Stroomi ranna liigutatavaid piknikupinke, mida inimesed vastavalt vajadusele ümber liigutasid, sageli varjudes päikese eest puude varju ja tuule eest hekkide taha.

Samas esines ka tegevusi, mis olid unikaalsed kas ainult Stroomi rannaalale või Koplirannale, milleks olid näiteks kibuvitsaviljade ja kaseokste korjamine, ratastoolis või käimisraamiga võimaldatud liikumine Stroomi rannapargis ja alasti ujumine ning lõkke tegemine maapinnal Koplirannas. Mõlemad alad pakkusid kasutajatele selliseid võimalikke kasutusi, mis suure tõenäosusega on võimalikud ainult seal. Kui Stroomi rannaparki iseloomustab paljuski mugavus, ligipääsetavus ja turvalisus, siis Kopliranna omadusteks võib tuua eraldatuse ja avastuse (uudsuse).

Peamise leiuna kasutajagruppide analüüsis võib tuua selgelt vaadeldavad kasutuserinevused meeste ja naiste vahel: Naisi registreeriti kogu uuringuala peale rohkem kui mehi, kuid Kopliranna kasutajate seas olid ülekaalus meessoo esindajad. Samuti erinesid nende külastused nädalapäevade ja kellaaja lõikes: eriti selgelt eristatav naissoost külastajate suurem osakaal nädala sees, kelle hulgas oli lisaks rohkem lapsevankritega jalutajaid kui neid oli nädalavahetusel külastajate seas.Nädalavahetustel oli mees- ja naissoo esindajate vahe väiksem. Mõneti üllatuslikult leidus nende seas, kes külastasi d uuringuala õhtusel ajal üksinda rohkem naisi kui mehi. Mehed külastasid ala sagedamini grupis ja naised paaris.

Nädala sees oli pärastlõunaste külastuste arv peaaegu kahekordne võrreldes lõunal tehtud külastuste arvuga. Nädalavahetustel olid erinevused erinevate ajavahemike vahel väiksemad. Hommikuste külastuste arv oli seevastu suhteliselt stabiilne kõikide nädalapäevade lõikes.

Veega seotud tegevuste arv sõltus mõneti ilmastikutingimustest, sooja ilma korral esines neid sagedamini ja näiteks vihma korral ei registreeritud ühtegi veega seotud tegevust. Vanusegruppidest veega seotud tegevustega hõivatuid registreeriti ootuspäraselt kõige rohkem laste seas. Kopliranna alal registreeriti veega seotud tegevusi laste, teismeliste ja vanurite seas; täiskasvanud kasutasid seda võimalust ainult Stroomi liivarannal.

Uurides, millised regulaarsed harjumused, mis võivad potentsiaalselt olla kasulikud tervisele ja sotsiaalsetele sidemetele, nagu jalutamine, tervisejooks ja koeraga jalutamine, tuli välja, et ebasoodsate ilmastikutingimuste korral olid protsentuaalselt kõige vähem ustavad oma tegevusele koeraga jalutajad.

Võimalikke tuleviku planeeringuid ja muudatusi prognoosides tuleks arvesse võtta, et need kaks omanäolist ala täiendavad teineteist, ja seda omadust võiks pigem edaspidigi rõhutada, rakendades läbimõeldud meetmeid, mis füüsiliselt pigem sekkuksid vähem kui rohkem ala hetkel kehtivasse korraldusse. Samuti võiks kaaluda sihilikult erinevate sotsiaalsete rühmade, näiteks täiskasvanud meeste suuremat kaasamist disaini- ja poliitotsuste tegemisele, et selgitada, kas nende huvi linnalisi rohealasid kasutada on suurem kui tegelikkuses realiseeritud külastused, ja tuua välja rohealade sobivad omadused ja elemendid, mis aitaksid kujundada sihtgrupi terviseharjumusi positiivses suunas.

Hereby I, **Pille-Riin Kiisküla**
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